

**PROPOSED JOINT LANDFILL
PANAMA**

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By

Frank Ohnesorgen

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TABLE OF CONTENTS

1	Background.....	1
2	Objective.....	1
3	Activities.....	1
4	Observations	2
5	Conclusions.....	3
6	Recommendations	5

Attachment A. List of Persons Contacted

ABSTRACT

At the request of USAID/Panama, Frank Ohnesorgen visited the municipalities of Arraijan, La Chorrera, and Capi, Panama, to provide technical assistance for the construction of a joint sanitary landfill. The consulting assignment was carried out as part of USAID's Municipal Development and Management Program (Contract No. PCE-C-00-95-00001-00, RFS No. 63), implemented by the International City/County Management Association (ICMA).

PROPOSED JOINT LANDFILL—PANAMA

1 BACKGROUND

The municipalities of Arraijan, La Chorrera, and Capira have requested USAID/Panama's assistance in contracting studies for the construction of a joint sanitary landfill. The municipalities of La Chorrera and Arraijan have been using the landfill of La Chorrera for final disposition of solid waste, and the municipality of Capira is disposing of solid waste in a mangrove swamp.

2 OBJECTIVE

The objective of the consultant's visit to Panama during September 30 to October 9, 1998, was to provide technical advice to USAID/Panama on the suitability of developing a joint landfill for the municipalities of Arraijan, La Chorrera, and Capira versus individual solutions.

3 ACTIVITIES

The consultant carried out the following specific tasks:

- Met with officials from the Municipios Siglo XXI Project.
- Visited and met with mayors and officials of Arraijan, La Chorrera, and Capira.
- Met with the sub-director of the Ministry of Planning.
- Reviewed documentation on the joint landfill project.

In addition, the consultant:

- Visited the municipality of Chilibre and discussed with the head of the Junta Comunitaria the solid waste issues of that community.
- Visited El Patacon, a large landfill that serves Panama City and the surrounding area.
- Reviewed and provided comments on a landfill proposal submitted to USAID by the Mayor of Chitre.
- Reviewed *Recycling in Panama: An Industry Overview*, a paper by Mollie T. Brown, June 1998.
- Reviewed *Solid Waste Management in Panama*, a paper by Vijay Aswani, undated.
- Reviewed draft documents from the Municipios Siglo XXI committee: terms of reference for the technical and economic study on the proposed joint landfill and intermunicipal agreements among Arraijan, La Chorrera and Capira for the joint landfill.

4 OBSERVATIONS

4.1 Capira

The consulting team visited Capira's mayor, who informed them that this municipality of approximately 30,000 citizens generates about 15 tons of solid waste daily. The municipality has a collection system consisting of four trucks, and there is some private collection in areas not served by the municipality. The main economic base in the municipality is agriculture and includes large cattle, chicken, and pig farms. These contribute to water, soil, and air pollution.

The municipality has its own disposal site, which is a mangrove swamp whose waters flow into the ocean. Solid waste is burned there on a daily basis; however, the site is very well controlled and is rather clean. At the site there are many tires and some car bodies, which are not being recycled. The site does not meet environmental standards and is contributing to pollution of both water and air.

The road to the site is approximately 2 miles from the center of the municipality and is difficult to travel, especially during the rainy season. The road has only one or two illegal dump sites, which mainly contain discarded appliances that could be recycled. The mayor informed the team that the municipality has no formal recycling program, but there is some informal recycling.

4.2 La Chorrera

According to the mayor of La Chorrera, the municipality's 90,000 citizens generate approximately 80 tons of solid waste per day, six days per week. The municipality has a solid waste collection system consisting of five trucks. Much of the solid waste is collected by private haulers.

The municipality charges a fee for collection service and a small fee for disposal, but citizens rarely pay the fees. The mayor stated that solid waste collection and disposal services cost approximately \$250,000 a year, and the municipality only collects \$60,000 in fees.

The solid waste disposal site in La Chorrera serves the two municipalities of La Chorrera and Arraijan. This is also the site that the Municipios Siglo XXI committee has selected for a joint regional landfill to serve Arraijan, Capira, and La Chorrera.

The disposal site is in a mangrove swamp and is an extension of an old dump site next to an ocean beach. The Spaniards engineered and designed the site as a landfill and also furnished some landfill equipment. There are indications that the site was operated as a landfill for a short time; however, when the consulting team visited the disposal site, it was being used as an open dump without any environmental safeguards. There were no indications of recent excavations nor daily cover. All the landfill equipment seemed to be abandoned and in disrepair. Dozens of scavengers were picking up refuse for informal recycling, but there was no sign of control or operational management.

According to the mayor, La Chorrera has no formal recycling program; however, informal recycling appeared to be common. Besides the large number of scavengers on the site itself, next to it the team observed a large area that appeared to be a collection area for car bodies and other metals for recycling.

The road to the disposal site is itself a series of dumping sites. There were no signs of controls to prohibit dumping along the roadway, nor did the roadway appear to have been cleaned in some time.

4.3 Arraijan

The mayor of Arraijan estimated that approximately 40 tons of solid waste are generated daily by that municipality's approximately 60,000 citizens. The municipality does provide some collection services, but private haulers provide a large proportion of collection services.

Arraijan is the only one of the three municipalities visited that does not have a municipal disposal site, nor does it appear to have adequate land to build a disposal site. Therefore, it must ship its solid waste to some other municipal disposal site.

The municipality's collection trucks take their solid waste to the disposal site in La Chorrera, while the private collectors dispose of their solid waste at the El Patacon site in Panama City. The major reason for this is that the municipality does not have a very aggressive solid waste fee collection system and therefore does not have the funds for the high fees at El Patacon site.

Arraijan, like the other two municipalities visited, does not have a formal recycling program. However, as in the other two, an informal system of recycling is active.

5 CONCLUSIONS

5.1 The Joint Landfill

A joint landfill is a feasible concept that can be very beneficial if the landfill is well planned, designed, engineered, financed, and operated. To fulfill these criteria in an environmentally sound way takes time and a lot of citizen involvement. The consultant believes that the proposed site in La Chorrera is not a good choice for a joint landfill for the following reasons:

5.1.1 Risk to the Environment

The site is not environmentally sound because:

- It is too close to the ocean beach and to a mangrove swamp.
- The water table is too high. (According to the plan the Spaniards developed, the water table is 2 to 4 meters from the ground surface.)
- It is too close to residences. (It is within 1,000 meters of various homes and farms.)

- It is too close to residential water wells. (The consulting team observed two windmills and one pump station within 1,000 meters of the site.)
- The road to the site is difficult to travel in bad weather.

5.1.2 Lack of Citizen Participation and Support

Two of the mayors from the participating municipalities stated that they were not brought into the planning process. The other indicated that the site would be contracted out to a Spanish firm. One mayor indicated that the Corridores in his municipality did not agree with the site or the project. If not even the mayors were allowed to participate, or if they were misinformed, then the citizens in these three municipalities were surely not given an opportunity to participate in the site selection process.

During the consultant's visit a newspaper article appeared in which the National Environment Agency for Panama indicated that the site was not environmentally appropriate and that the agency would protest the siting of a landfill on it. Another newspaper article that appeared during the visit indicated that the region's private collectors were also against the site selection.

5.1.3 Lack of Organization

None of the mayors nor their staff that the consultant met with could list the characteristics of their waste, hauling distance to proposed site, or other information needed to determine the size of landfill required as well as to project the life of the landfill. (The landfill should be designed to last a minimum of 20 years.)

All parties that the consultant interviewed indicated that environmental impact, geological, hydrological, and topographical studies have not been conducted for the site. These should have been completed before the site was purchased or selected.

No one has yet determined who will operate and be responsible for the landfill. One mayor wants to turn it over to the private sector, but the others are undecided. This should have been one of the first items resolved, and mayors and citizens from the participating municipalities should have been part of the process.

5.1.4 Unrealistic Plan

An environmentally designed landfill requires time to be planned, engineered, designed, and permitted (a process that takes two to three years in the U.S.). Once the site is designed and permitted, it takes one to two years to construct roads, drainage systems, leachate collection systems, methane gas collection systems, and cell excavation; purchase equipment; build or acquire other support systems; and train key personnel. All these tasks cannot be adequately completed in 8 to 10 months, as planned in the joint landfill proposal.

5.2 Capira

Capira's amount of daily waste is small enough so that the municipality could design and operate a small landfill if it was located in an environmentally sound site (not the present man-grove site). This landfill could be the trench type, and daily cover could be provided manually by two or three workers. The municipality would need to be more aggressive in collecting user fees to pay for the landfill's operation as well as for the collection system. Along with this, a formal recycling program should be put in place.

5.3 La Chorrera

The site at La Chorrera should be closed and the area cleaned up, after an environmentally adequate site has been designed, permitted, and prepared. If an adequate site cannot be located, a transfer station should be built, and the solid waste from this municipality should be hauled to El Patacon. Regardless of which choice the municipality makes, it has to be more aggressive in collecting and establishing user fees that support the collection and disposal system. Otherwise, La Chorrera will continue to experience the same problems it has now.

5.4 Arraijan

Arraijan should haul all of its solid waste to El Patacon. The municipality does not have adequate land for a landfill and is close enough to El Patacon to make this feasible. However, the municipality needs to be more aggressive in establishing adequate collection and disposal fees. No municipality can collect or dispose of solid waste without adequate financial resources.

6 RECOMMENDATIONS

The following areas are, in the consultant's opinion, the most important issues that need to be addressed for the protection of the Panama City Watershed (PCW). These recommendations can be developed into programs to have a greater impact on the PCW's environment.

6.1 Recycling

Recycling is key to reducing solid waste. Therefore, a well thought out and well coordinated program should be developed and implemented by all of the regions' municipalities. The informal system of recycling and scavenging that already exists throughout the area implies that there are markets for the recycled products (see *Recycling in Panama, An Industry Overview*, Mollie T. Brown, June 1998).

Recycling involves all sectors of society and fosters citizen participation, which helps develop community spirit and encourages other environmental programs. Also, recycling programs can be implemented easily and quickly.

6.2 Composting

Comprehensive composting programs should be developed throughout the region, using both residential and agricultural (chicken, pig, and cattle) waste. Composting, like recycling, reduces waste and gets citizens involved. In this case it would also involve large agricultural businesses, which would bring the community together and foster cooperation.

Composting programs are easy and inexpensive to develop. There are many programs worldwide that can be replicated in Panama; for example, the composting of chicken manure in Guatemala for commercial purposes and the backyard composting of kitchen waste and lawn clippings in Chandler, Arizona.

6.3 Industrial Waste Discharge

Unregulated industrial waste needs to be addressed formally and quickly. A program needs to be developed to identify and categorize all commercial and industrial discharges as a prerequisite for establishing a pre-treatment program. The consulting team was told that currently there is little if any control of commercial or industrial wastewater discharge. Some laws and enforcement procedures will eventually be required, at least at the local level, if a pre-treatment program is to be effective.

6.4 Residential Wastewater

No one seems to be paying attention to residential wastewater discharge. This area, in the consultant's opinion, has a much greater potential to affect the PCW than even solid waste. A population as dense as in the PCW cannot continue to discharge its wastewater into septic tanks. Wastewater treatment plants will be needed very soon. A program to study this problem should be designed, and it should include all levels of society, from the federal government to businesses and individual citizens.

6.5 El Patacon Disposal Site

The El Patacon landfill site is another area that needs to be addressed immediately. The site is not being operated as a landfill; it is just a large, semi-controlled open dump. Poor management has allowed the site to pollute the surrounding rivers (see *Solid Waste Management in Panama*, Vijay Aswani, undated, p.4). During the visit, the consulting team observed the leachate ponds overflowing into a nearby creek.

The site is still a good site, but plans need to be developed to mitigate the existing pollution and to redesign the rest of the site into an environmentally sound landfill. Contracting the site out to the private sector will not solve the problems of mitigation unless mitigation is included as part of the contract. The site also has good potential to become an electric generating facility if the methane gas is mined.

6.6 Municipal Employee Training

A training program needs to be implemented to adequately train municipal employees in solid waste management. In order for any of the other recommended programs to be successful, municipalities need well trained employees to make them efficient and effective. Even if some services such as collection or disposal are contracted out to the private sector, municipalities need well trained employees to oversee and monitor the contractors' work. Training solid waste managers is fairly easy to accomplish and not too expensive. The programs are easy to start because there are many examples to follow.

6.7 User Fees

A public information campaign should be developed to educate local government officials and citizens about the importance of paying for municipal services received. Services cost money, and without funds a municipality cannot provide or contract for services. In other countries in Central America (e.g., Costa Rica, Honduras, and Guatemala), citizens are already paying for solid waste services and receiving good service in return.

Local governments need to be honest with their citizens and bring them into the decision-making process. If citizens know where their money is going and understand the need for funding good service, they are willing to pay for that service. ICMA's programs throughout Central America have experienced these results when citizens are involved in decision making.

6.8 Possible Pilot Programs

The final recommendation is that small pilot programs on different aspects of solid waste management should be implemented in municipalities that have good potential for success. Two suggested models are:

Capira

- Build a small, environmentally designed landfill that can be operated by manual labor
- Develop formal recycling and composting programs
- Train municipal employees in solid waste management
- Improve fee collections.

Chilibre

- Plan a well designed transfer station/recycling center
- Develop formal recycling and composting programs
- Train municipal employees in solid waste management
- Develop realistic user fees.

ATTACHMENT A

LIST OF PERSONS CONTACTED

Lars Klassen	Mission Director, USAID/Panama
Robert Hellyer	Chief Program Office, USAID/Panama
Jerry Bauer	Office of Sustainable Development, USAID/Panama
Edna de Jaen	Municipal Programs, USAID/Panama
Raul Ramirez	Municipal Programs, USAID/Panama
Lic. Ana Rios de Rengifio	Despacho de La Primera Dama, Programa Municipios Siglo XXI
Rosadela de Pinzon	Sub Directora de Planificacion y Coordinacion General Ministerio de Planificación y Política Económica
Ivan Ulises Sauri	Mayor of Capira
Eric Almanza	Mayor of La Chorrera
Mayor of Arraijan	
Head of Junta Comunitaria, Chilibre	
Municipal Engineer, La Chorrera	